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Abstract
This mixed research methods study explores whether project-based service-learning projects promote greater learning than standard project-based projects and whether introduced earlier into the curriculum promotes a greater student understanding of the world issues affecting their community. The present study focused on comparing sophomore and junior residential interior design courses that had project-based service-learning assignments. Both undergraduate sophomore and junior courses developed standard design project assignments in the first half of the academic semester and a project-based service-learning assignment in the second half of the academic semester. Collection of research participants' perceptions was through pre and post surveys and course-required reflection journals. The research findings indicated that the opportunity to work with an actual non-for-profit client and actual building were the most important influence on student learning outcomes. Yet, findings also indicate that on a more personal level students reported experiencing deeper emotional growth due to their knowledge that their design solutions would ultimately improve the lives of others in the community. Furthermore, evidence shows that the service component of the project had no significant influence in student learning, regardless of academic level. Consequently, suggesting that project based service assignments may occur at any point in the curriculum.

Keywords
Interior design, experiential learning, service projects, open design studios

The Effects of an Experiential Service-Learning Project on Residential Interior Design Students' Attitudes toward Design and Community

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This mixed research methods study explores whether project-based service-learning projects promote greater learning than standard project-based projects and whether introduced earlier into the curriculum promotes a greater student understanding of the world issues affecting their community. The present study focused on comparing sophomore and junior residential interior design courses that had project-based service-learning assignments. Both undergraduate sophomore and junior courses developed standard design project assignments in the first half of the academic semester and a project-based service-learning assignment in the second half of the academic semester. Collection of research participants' perceptions was through pre and post surveys and course-required reflection journals. The research findings indicated that the opportunity to work with an actual non-for-profit client and actual building were the most important influence on student learning outcomes. Yet, findings also indicate that on a more personal level students reported experiencing deeper emotional growth due to their knowledge that their design solutions would ultimately improve the lives of others in the community. Furthermore, evidence shows that the service component of the project had no significant influence in student learning, regardless of academic level. Consequently, suggesting that project based service assignments may occur at any point in the curriculum.

INTRODUCTION

John Dewey (1938), who is considered the father of America's progressive education and service-learning, promoted the belief that education involves all of a student's experiences, not solely academic experiences (Hatcher & Eramus, 2008; Hugg & Wurdinger, 2007). Dewey believed that students needed to experience education within the context of their life experiences, be they academic, social, or cultural. Project-based service learning speaks to Dewey's education theory of providing students with opportunities to understand and integrate the lessons learned in the classroom with complex real-world issues. Project-based service-learning challenges students to integrate, and adapt the technical, analytical, and interpersonal skills learned in the classroom (Brown & Kinsella, 2006). Butin (2006) further suggests that through a scholarship of engagement, such as project-based service-learning, students are able to bridge the gap between the abstract knowledge gained in the classroom and everyday life practices.

Service learning as pedagogy has grown in popularity over the last few decades to where it that it has become institutionalized within America's higher education system (Butin, 2006). The spread of service-learning across higher education is due in large part to (a) the work of Campus Compact (2005), a national coalition of colleges and universities that supports student education along with civic duty and (b) America's higher education's embrace of the scholarship of engagement (Brown & Hesketh, 2004; Butin, 2006; Hatcher & Eramus, 2008; Hugg & Wurdinger, 2007). Service learning promotes students' acquisition of practical experience and academic knowledge so that students can become more marketable in today's growing global marketplace (Hugg & Wurdinger, 2007; National Association of Colleges and Employers, 2014). With today's global marketplace growing increasingly more competitive and continuously evolving, recent graduates can no longer just stand on the laurels of a strong resume and academic successes. Graduates have to demonstrate real-world experiences that are marketable and practical.

The current study explored student perceptions of project-based service assignments to examine whether introducing these types of projects earlier in the curriculum promotes greater learning and understanding of the issues affecting the surrounding community. The research study compared sophomore students in their first year of the interior design program with junior students in their second year of the interior design program. Both undergraduate courses required standard project-based assignments in the first half of the academic semester and a project-based service-learning assignment in the second half of the academic semester. In addition, both interior design courses conducted similar design projects for the same non-profit urban redevelopment entity. The non-profit entity asked students to review and analyze the existing conditions of two of their downtown affordable housing units and suggest interior design improvements.

This research study is significant because even though Kenworthy-U'Ren (2008) and Yorio and Ye (2012) indicate that there has been considerable growth in service-learning projects in higher education, research appears to be limited to the general university population. The perceived value of service learning in applied arts disciplines, such as interior design, appears to be underdeveloped — hence the need for this research study's focus on project-based service-learning for interior design courses. In addition, research that contributes to understanding how service learning can engage and enhance student learning in project-based courses is important for educational policy development for two reasons. First, the educational and institutional factors that accompany the integration of service learning into the curriculum will be better understood (Furko, 2004, Yorio & Ye, 2012). Second, a more complete understanding of the integration of service learning with project-based assignments can provide guidance as to "where" to integrate real-world experience into a course's or curriculum's learning objectives.

LITERATURE REVIEW

Project-Based Learning

Project-based learning is not a new concept in the American

educational system, as it has been widely used in public schools since the early 20th century (Hugg & Wurdinger, 2007). John Dewey in the early part of the 20th century began to tout the value of project-based learning as the pedagogy that bridged the learning experience of students and teachers as well as students and society itself (Dewey, 1938; Hugg & Wurdinger, 2007). Fundamentally, project-based learning pedagogy provides students with challenging opportunities that involve in-depth exploration, problem-solving skills, collaboration, and decision making while also allowing students to work autonomously or in teams over extended periods of time and ultimately culminating in creative presentations (Jones, Rasmussen, & Moffitt, 1997; Asmidar, Nor, Latib, & Bhkari, 2012). Because project-based learning allows students to work individually and in teams autonomously for extended periods, students have opportunities to refine various skill sets, such as time management, communication, collaboration, leadership, and project organization (Hugg & Wurdinger, 2007).

Project-based learning, unlike other pedagogies, offers both linear and non-linear learning environments. Linear academic experiences, such as tests and quizzes, are those that methodically build upon each other to achieve certain learning outcomes. On the other hand, non-linear academic experiences, such as design projects, integrate in-depth exploration, reflection, and the practical application of learned skills and knowledge in order to obtain the meaning of learning outcomes (Hugg & Wurdinger, 2007). The central activities of project-based learning revolve around having students respond to a real-world need or issue so that they may experience constructing and transferring knowledge and ultimately experience communicating that knowledge in the standard vocabulary of the field of study (Asmidar et al., 2012; Hugg & Wurdinger, 2007).

Service Learning

Service learning, unlike extracurricular volunteer activities, is course-based learning within a structured framework (Bringle & Hatcher, 1996). Furthermore, service learning, unlike internships, provides experiential activities that are not necessarily skills-based or specific to certain areas of study. According to Kenworthy-U'Ren (2008), there is no specific definition of service learning among scholars; however, the scholarly consensus is that service learning is teaching specific learning goals through structured community service opportunities that respond to community-identified needs and opportunities. Bowen (2010, p. 2) provides a different view of service learning by broadly defining it as "a pedagogy that integrates relevant community service with academic instruction and learning, usually through structured reflection." On the other hand, Butin (2006) suggests that service learning is a transformative pedagogy that links the classroom with the real world and theory with practice.

Research conducted by Bringle and Hatcher (1996) suggests that by having students reflect upon the accomplished service activity, students gain a greater understanding of the course content, a broader appreciation for their discipline, and an enhanced sense of civic responsibility. Service-learning projects, through their concrete experiences and reflective opportunities, provide various learning opportunities to students as well as respond to the diverse learning preferences of students (Kenworthy-U'Ren, 2000; McLaughlin, 2010). Lastly, research conducted by Gallini and Moely (2003) found a relationship between being enrolled in a service-learning course and a willingness to enroll for the upcoming academic year.

Project-Based Service Learning

Project-based service-learning (PBSL), like other experiential learning activities such as mentoring and internships, interweaves learning objectives and service objectives to create mutually beneficial environments where community service recipients benefit and the students obtain a rich learning experience (Brescia et al., 2009; Rockenbaugh, Kotys-Schwartz, Reamon, 2011). The instructor acting as a facilitator and mentor provides a consistent level of supervision, expectation, and guidance throughout the entire (Brescia et al., 2009). For the best effect, teaching strategies focus on two collaborative efforts within the classroom for solving projects (Brescia et al., 2009). The first collaboration is amongst students. Different points of view brought forth encourage in-depth explorations for solutions, thereby providing a robust and realistic experience. The second collaboration, students and community service recipients, focuses on the merger of academic knowledge and practical skills to create innovative solutions to an issue or problem in the surrounding community.

The added authenticity of a service component to project-based learning challenges students to use their functional skills related to technology, critical thinking, and interpersonal skills to gain an understanding of the problems they must solve in their projects (Brescia et al., 2009). This blending of experiential learning activities has been found to promote personal efficacy, greater awareness of the surrounding environment, personal value identification, and a greater engagement in learning (Astin, Vogelgesang, Ikada, & Yee, 2000; Brescia et al., 2009).

Researchers Tawfik, Trueman and Lorz (2014) in their study of a STEM course demonstrated that the combination of service learning and problem solving projects empowered and engaged students, especially when on the site of the service portion of the project. The study further demonstrated that when on site students felt more comfortable in asking questions, and learned by experiencing how their solutions provided tangible benefits to the community. Researchers West and Simmons (2012) suggested that real world based projects with a service component have additional benefits for Hispanic students, specifically Hispanic students seeking a college degree in business. Researchers West and Simmons (2012) suggest that Hispanic business students are at a serious disadvantage in obtaining employment upon graduation because the students statistically have fewer college educated parents or know college graduate professionals in their communities. With most employment positions in business traditionally secured through the connections people have, West and Simmons (2012) found that projects that solve real world problems by serving communities provide Hispanic business students with opportunities to meet and make connections with individuals, while also enhancing the learning experience. Other studies have shown that students feel more connected to their communities and gain community prestige for participating in these types of projects (Eyler and Giles, 1999, Harkavy and Romer, 1999).

METHODOLOGY

This research study took place at a public institution of higher education in the southern region of the United States during the spring semester of 2015. This institution, where the researcher is a faculty member has declared that by fall of 2016 all undergraduate students must have completed at least one experiential learning experience in a course prior to graduation. According to the institution community related service projects fall within the spectrum of experiential learning. With that said the researcher, who is also an interior design faculty member who teaches sophomore to senior level courses, sought to explore at what academic level it would be appropriate to integrate a service component into design projects. Furthermore, if service is incorporated into projects, does having students aware that the service design projects they develop benefit others in their community enhance learning. This study's researcher was also the course instructor for the two residential interior design courses that were involved in the study.

Participants

The inclusion criterion was that students had to be part of one of the two residential interior design courses taught by the researcher that semester. The two courses, a sophomore level course and a junior level course, are yearly-required undergraduate interior design courses. Of all the students enrolled in both courses invited to participate in the study, all seven-sophomore students in-group A participated in the study, while seven out of 10 juniors in-group B chose to participate. Henceforth, the sophomore design studio is group A, while the junior-level design studio is group B. Because of the limitations of the research study's small sample population, the study does not allow for a generalization of the conditions of students' learning in the field of interior design. Demographic factors such as age, gender, or GPA were not relevant to the project because they had no bearing on the study's research questions.

Course Description

Students in these two respective courses typically work on project-based design assignments that consist of several phases and design issues. Even though each course typically occurs as a combination of lecture and open-studio environments, the course objectives are different. Group A's course emphasizes building construction methods and design, while group B's course focuses on kitchen and bath design. For research purposes, each course that semester had its design problem-based projects occur during the first eight weeks of the academic semester with the project-based service assignments happening over the last eight weeks of the academic semester. Even though group A students had one less year of experience in the interior design program than group B students, both sets of students resolved design problems commensurate with their respective course's design focus and student level of expertise.

The service-learning portion of the design projects was a result of the course instructor contacting a local non-profit affordable housing organization to see if the organization needed assistance in designing the interior spaces of their homes. The circumstances were such that when contacted by the course instructor, the non-profit organization was in fact in need of the assistance of an interior designer to conduct an analysis of the interior spaces of two of their low-income housing properties. The project based service design developed by group A, explored how the client might renovate an existing in-town home for a single low-income person who moves into the home in the fall of 2015. In turn, group B worked on a project based service design that analyzed the various spaces of an existing prototype home to explore how the client might be able to improve the space planning and overall interior design of the home. The client intends to incorporate the student recommendations in the design of future homes for local low-income families.

Because group A students had one less year of interior design experience compared to group B, the students in group A were assigned the project based service assignment that required a straight forward interior design solution. Group A students' academic level customarily has students primarily work on individual student design solutions with group collaboration playing a minor role in the project. In turn, group B students worked on the more complex analytical assignment. The academic level of group B students requires assignments that challenge students' critical thinking skills and increase exposure to student team projects while still developing individual design solutions.

Both design projects had three phases. Phase one, pre-design, consisted of a series of meetings with the client and visits to the existing homes to document the existing conditions of the homes. Both groups of students while in their respective courses working in teams of two measured rooms and located cabinetry, electrical outlets, light switches, light fixtures, smoke detectors, air vents, doors and windows, appliances as well as note existing wall and floor materials. Phase two design experiences consisted of the evaluation of existing conditions, the exploration of space planning solutions, and a proposal of interior design improvements and new materials. Group A students in this phase worked as individual designers, while group B students continued to work as teams of students. Phase three the final submission, involved presenting to the client proposed interior design solutions. Group A's project culminated with group A students formally presenting final boards and a set of design development drawings to the client for their use and consideration. While Group B students presented their recommendations to the client in booklet form for review and potential incorporation into the prototype home design.

Procedures

The researcher informed students of the research study week eight of the semester. As encouragement for student participation, the researcher, as the instructor for both courses, offered research participants extra credit to participate in the study. Participants were required to submit a reflection journal that outlined their perceptions on completing the service-based design project. In addition, participants completed an online survey before and after the project based service design assignment to compare the differences between participants of student group A and student group B while measuring participants' expectations and perceptions of the service design experience. The researcher, who developed the online survey, did so utilizing Survey Monkey online testing services so that participants could access the survey at their leisure and have the survey formatted and downloaded to the SPSS 22 program software for statistical analysis. The survey commenced with asking participants to list their academic level. Next, participants were asked to rate their level of agreement with 27 closed-ended survey questions using a five point Likert scoring system of *strongly agree* (1) to *strongly disagree* (5).

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The researcher prior to commencement of either design project as the instructor explained to the students that the project based service design projects would assist a local non-profit client in developing better-designed low-income homes. The researcher further noted to the students that the client's company developed and built homes for those low-income families wanting to live in the city's downtown area. Other than, the knowledge that the students' work might lead toward improving the home lives of others in the surrounding community the instructor provided no additional educational information on service learning.

FINDINGS AND ANALYSIS

This exploratory research study adopted a mixed methods approach comprising both quantitative and qualitative elements. The quantitative phase of the study processed and analyzed the responses gathered from the online survey developed by the researcher. The research study conducted descriptive statistics and Mann-Whitney tests to analyze the survey responses related to significant differences between student group A and student group B participants. A reflective paper served as the qualitative measuring tool. The researcher broke down the qualitative data into topics and coded similar statements. The researcher found regularities within the data that served to validate the accuracy of the themes.

Quantitative Phase

Research question one: Do hands-on experiential design projects and collaborative projects placed earlier in the curriculum add depth to interior design learning?

H01: Hands-on experiential and collaborative projects placed earlier in the curriculum have no significant effect on interior design learning.

HA1: Hands-on experiential and collaborative projects placed earlier in the curriculum add a significant difference to interior design learning.

The first 18 questions of the survey produced the quantitative data for research question one. The researcher performed a reliability test to examine whether the 18 questions were all measuring the same construct. The researcher found an acceptable Cronbach's Alpha value of .665 for the pre-project survey and a .816 value for the post-project survey, which indicated that the construct is reliable for both surveys. Descriptive statistics measured the group mean score for the individual responses of both surveys. Of the 18 responses for research question one, survey questions 5, 6, 7, 9, 15, 17, and 18 had a higher pre-design project mean than the same post-design project questions, thus suggesting that both groups of students were neutral to negative about working in teams and being outside of the classroom at the beginning. However, overtime students gradually became more positive about these issues. Participants were more likely to dislike working on projects that were solely one-task oriented, such as writing analyses or model making. In other words, the higher pre-project means indicate the possibility that both groups of participants were expecting a more neutral to negative learning experience when working in teams and outside of the classroom.

In turn, the higher post-project mean scores indicate that participants were more neutral or negative about their experiences after completing the project. The mean scores illustrate that both sets of participants 11 out of 18 questions were more positive before working on the assignment than after completing the assignment. Yet, students at the end of the assignment were more positive about working on experiential learning projects that incorporated written and drawing work. Students after the assignment further became more positive about working independently or in groups in and outside of the classroom. Table 1 illustrates the group statistical mean and standard deviation scores of each of the 18 question responses for research question 1.

Pre-Service Design Project

When the mean and standard deviation scores are viewed by academic level, sophomore participants or group A had higher mean scores, indicating a tendency toward a negative perception of project based service projects in all cases. While the lower mean scores of junior participants or group B, suggested a more positive perception of service-based design projects. Whether the assignment occurs outside or inside the classroom appears to have had no bearing on student perceptions. See Table 2 for pre-service project descriptive statistical scores based on academic level.

The Mann-Whitney U test (Table 2) for the pre-service project survey revealed that differences between student group participants were not statistically significant, with $p > 0.05$ in 15 of 18 cases. The null hypothesis is not rejected suggesting that project based service assignments placed earlier in the curriculum have no significant effect on interior design learning. Yet, for questions 4, 12 and 13, which pertain to experiential learning enhancing critical thinking skills by relating real world issues to class lectures the null hypothesis is rejected, thereby indicating that hands-on experiential and collaborative projects, such as the two interior design projects, placed earlier in the curriculum add a significant difference to interior design learning.

Post-Service Design Project

In the case of the post-service design project data, group A once again expressed higher mean scores than group B students, which suggests that group A perceptions were more neutral or negative toward working on service-based project assignments (Table 3). The analysis further suggests that even though both groups A and B students prefer to have project-based service assignments that require one task rather than multiple tasks, group B students in particular tended to be more negative toward having the assignment consist of various tasks such as writing, creative design, and model making.

With the exception of questions 1 and 4, the Mann-Whitney U Test for the other survey questions indicates that the differences between student groups A and B are not statistically significant with $p > 0.05$ values (Table 3). Thereby in 16 out of 18 survey questions, the null hypothesis fails to be rejected. Consequently, hands-on experiential and collaborative projects placed earlier in the curriculum continue to have no significant effect on interior design learning.

Survey questions 1 and 4, which pertain to written assignments enhancing the learning experience the Mann-Whitney U test indicates that the null hypothesis $p < 0.05$ values (Table 3) is rejected. Thereby suggesting that hands-on experiential and collaborative design projects that incorporate written assignments and are placed earlier in the curriculum add a significant difference to interior design learning. Specially, for group B that was more positive toward incorporating written assignments into design projects. This finding is an interesting contrast to an aforementioned finding the data analysis uncovered, that is that group B perceived negatively the use of writing when required with several other tasks on a project based service assignment. Consequently, the researcher is lead to postulate that limiting the amount of tasks to design and writing on a project is more appealing to the higher level students because more time is available to focus on fewer tasks, thus a higher level of proficiency is gained in those tasks.

Research question two: Does hands-on learning projects that service local communities have an equal influence on sophomore and junior level interior design students' learning?

H02: Hands-on experiential learning projects servicing the local community have no significant influence on sophomore and junior interior design students' learning.

HA2: Hands-on experiential learning projects servicing the local community have a significant influence on sophomore and junior interior design students' learning.

The quantitative data collected for the analysis of research question two came from survey questions 19 through 27. The study conducted the analysis of the individual responses with descriptive statistics and Mann-Whitney U tests. A Cronbach's Alpha reliability test found the nine survey questions measuring the same construct with a value of .796 for the pre-project survey and a .771 value for the post-project survey, which indicated that the construct is reliable for both surveys.

With the exception of survey questions 23 and 27, the mean values for seven out of nine survey questions were higher for the post-project than the pre-project mean values, indicating that both groups of students upon completing their respective projects had gained a slightly more neutral to negative perception of the project. For instance post project responses suggest that working on a design service project that served the students' community did not encourage students to explore additional creative solutions or improve comprehension of course material. More importantly, the post project findings also suggest that if students had the chance to work solely on service-oriented design projects students perceived the service oriented design projects more negatively. Yet, survey question 23 responses suggest that student perception of preferring to work on experiential learning projects that service their community changed from slightly neutral at the beginning to a more positive outlook after completion of the project. These findings lead the researcher to postulate that students prefer to work on design projects that allow them to gain experience in solving real world issues while also engaging with their community through service. Survey question 27 responses further indicated that student perception of working on the project as individual designers was slightly more favorable at the completion of the project as opposed to the beginning of the project. Table 4 illustrates the group statistical mean and standard deviation scores of each of the nine question responses for research question two.

Pre-Service Design Project

Mean scores analyzed by academic level, revealed that group A, the sophomore participants had higher mean scores in all cases except for questions 21 and 27. The equal mean scores for group A and group B for survey question 21's suggests that regardless of whether the assignment is service-based or not, students will put forth the necessary work ethics to complete the assignment (Table 5). In turn, survey question 27 indicates that group B students at the beginning of the project had a less favorable perception about working as individual designers than group A students. Survey question 26 responses not only lend support to this notion that group B students favorably prefer working in student teams rather than as individual designers.

The Mann-Whitney U test (Table 5) revealed that for survey questions 20, 21, 23, 24, 25, 26 and 27 or seven out of nine cases there was no statistically significant differences between student group A and B participants with $p > 0.05$. Consequently, null hypothesis is not rejected, suggesting that hands-on experiential learning projects servicing the local community have no significant influence on sophomore and junior interior design learning. The Mann-Whitney U test also revealed that the null hypothesis is rejected for survey questions 19 and 22, indicating that there is a statistically significant difference between the two groups of students. Survey question 19 shows that experiencing first hand service related projects encourages students to engage more in comprehending the course material. While survey question 22 suggests that learning improves when students have the opportunity to experience firsthand the effects that their design projects have on others in their community.

Post-Service Design Project

In all cases, with the exception of survey question 27, the mean scores for group A, the sophomore students, were higher than group B student scores. Consequently, suggesting that group A is more neutral to negative toward their perception that these types of experiential design service projects will be able to encourage more comprehension of course material, working harder on projects, or encouraging greater exploration of creative designs (see Table 6). Survey question 27 findings on the other hand suggest that the two groups of students over the course of the project remained neutral about working as individual designers rather than on student teams. Yet, when asked in survey question 26 if students would rather work in teams as opposed to individual designers, both group A and group B students over the course of the project grew slightly more neutral and favorable about working in teams (see Table 6).

These findings contrast with another research finding that revealed that when participants are looked at as a whole, regardless of academic level, upon completion of the project students had grown slightly more negative in their preference to work in teams and slightly more favorable about working as individual designers (see Table 4). The researcher can only speculate that group dynamics and project complexity may have played a role with student responses. The calculated Mann-Whitney U Test indicated that there is no statistically significant difference with p values of $p > 0.05$ values (see Table 6). Therefore, the null hypothesis is not accepted, indicating that hands-on experiential learning projects servicing the local community have no significant influence on sophomore and junior interior design students' learning.

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Qualitative Phase Findings

While the quantitative analysis reflected statistically significant differences amongst student perceptions toward working on project-based service assignments, the students' reflection writings gave a clearer understanding of the students' overall learning experience of working on the project-based service assignments. After reviewing the student reflection writings, four themes emerged in order of frequency: hands-on experience, learning beyond the classroom, personal growth, and community growth.

Hands-on experience. First, the hands-on experience theme included the students being involved with the client to some degree and a first-hand integration of what happens in the real world with skills and concepts learned in the classroom. Consequently, the students experienced obstacles and successes that commonly occur in interior design projects, and the students gained knowledge in how to resolve real-world problems. The hands-on experience also helped to build up student portfolios and resumes as well as provided experience in speaking to a client. The following student quotes depict their real-world experiences that represent the hands-on learning theme.

> One group A participant states, "*While I know that not all of my recommendations will be implemented in the renovation of the house, the fact that I am making recommendations for a house that I have seen. In a way I think more about my selections and space planning because it will affect a real person who will be living in the house.*"
>
> One group B participant states, "*Working on a real home with tangible dimensions allowed me to understand the scope of the project and the actual layout much better than simply being handed a piece of paper with dimensions.*"

Learning beyond the classroom. Learning beyond the classroom is the next important theme. Students often mentioned how much they enjoyed working on a real project that allowed them to see, measure, and experience the building assigned to analyze and renovate. Students further added that the ability to experience a design project that had a real building and client made the project real. The students viewed working on the design assignment beyond the boundaries of the classroom as a positive aspect of working on the project. The following student quotes depict their real-world experiences in terms of learning beyond the classroom.

> One group A participant states, "*I enjoyed working outside of the classroom and applying what I know to a real project. I enjoyed actually physically seeing the house.*"
>
> One group B participant states, "*My favorite aspect of this project was the experience outside the classroom. Visiting the house as well as meeting the client and individuals involved with making affordable homes available to families.*"

Personal growth. Often times, the themes of community growth and personal growth blended with participants connecting personal reward with the ability to enhance the living standards of others in their community. With that said, a few students also indicated that the service aspect of the project did not contribute to personal growth; rather, working with a real client was the contributing factor to personal growth. Students further indicated that their work ethic always dictates that they work hard and put their best effort forward on a design project, regardless of whether the project is service-based or not.

> One group A participant states, "*I don't think that the service aspect of the project had on overly huge impact on the way I performed and worked. I think there were other factors that influenced my work and my perspective on the project. Having an actual client, service-based or not, did change the way I worked.*"
>
> One group B participant states, "*Not only is doing service projects a great way to give back, it also made a huge difference getting to actually step foot in the house and hear about the house from the client. It was so nice to get out of the classroom, and I think getting the hands-on learning made me more passionate about the project.*"

Community growth. Overall, students expressed how personally rewarding it was to them in being able help others in the community thrive. Students further interconnected community growth with hands-on experience by reporting that along with having the hands-on experience of the project, by association, the service experience was rewarding.

> One group A participant states, "*It has been really interesting to see design from a different perspective and do something that is truly helping another person thrive. It feels good knowing that our project is working to make another person's life better and that we are giving back to our community.*"
>
> One group B participant states, "*I thoroughly enjoyed working on the project not only because it was hands-on work that gave us real-life experience; but also the knowledge that there was a purpose behind our designs. Assisting the client in their continuation of doing great work in our community is and has been a rewarding effort.*"

The qualitative findings support the notion that interior design student learning is enhanced at any academic level when students are able to experience working with a real client to solve a real world problem and are provided with an actual building they can visit. With that said, the qualitative findings also suggest that the service part of the project is an important contributor toward student personal growth and connectivity with the community.

DISCUSSION and CONCLUSION

With higher education institutions seeking to make student experiential learning richer in meaning this research study sought to explore whether the integration of a community service element into the design projects of two undergraduate interior design courses would enhance student learning, particularly if introduced earlier in the curriculum. The research study's findings revealed a host of personal benefits including learning and career development that interior design students experienced while developing design solutions for their respective project based service assignments. Even though students were academically able to incorporate course material and use technical skills in solving real world problems, it also needs to be acknowledged that students' interpersonal skills even though not related to course subjects is an issue that may have influenced student team dynamics and ultimately student learning experiences.

The quantitative findings for research question one, which dealt with whether experiential collaborative projects should occur earlier in the curriculum; suggest that design projects such as those given to the research participants can occur at any point in the interior design curriculum. Even though the quantitative findings revealed that these types of experiential design projects can occur at any academic level the findings also indicate that group A, the sophomores, consistently had a less favorable outlook toward working in teams and experiential design projects whether in or outside of the classroom. The findings also discovered that both groups of students, in particular group B students, prefer projects that focus on a few skills, such as design, writing and model making. These particular findings have implications for course instruction. For instance, interior design faculty may consider revising experiential collaborative design projects; in particular, courses for sophomore students to be shorter in duration, a combination of individual and team efforts, limit tasks and occur both in and outside of the classroom.

Because interior design is a profession that combines individual work and collaborative efforts as well as require critical thinking skills inside and outside of the office, it is interesting to note that if you look at both groups as one unit these design project experiences altered students' perceptions on working in teams as well as learning in the classroom. Over the course of the design projects students appear to have gained a more favorable view of working in the classroom as teams and individual designers, which is an indicator that students are becoming better prepared to weather a professional environment. It is also interesting to note that above all else the students came to value the opportunity of working on a real building that they could visit and take that firsthand knowledge of the building to solve design problems. The students' reflections indicate how important it was to the development of their design solutions to be able to have the ability to learn and integrate skills and concepts beyond classroom boundaries. Seeing and experiencing the projects' actual building provided an additional visual layer for learning and interweaving of classroom concepts with a real world context.

The researcher as the instructor observed student progress in design critical thinking skills, improvement in technical drawing skills and communicating design-processing issues. Quantitative findings revealed that group B, the junior students, from start to finish was consistently more favorable toward working on collaborative experiential projects. This finding supports the notion that the closer students are to graduation students might be more willing to partake on collaborative experiential learning projects outside the classroom because it provides firsthand experience in applying classroom knowledge and skill sets to solve real world design problems. In doing so, design project solutions are richer in meaning and add value to student portfolios used to get employment.

Research question two explored whether design hands on projects that service local communities have an equal influence on sophomore and junior level interior design students' learning. The quantitative and qualitative findings provide similar and opposing views to this question. Participants' reflection writings indicated that participation in the service-based project positively affected both student learning in both groups and led to changes in attitudes about interior design and community. According to the reflection writings, students benefited from the opportunity to learn firsthand how to communicate with a client, to develop professional skills such as measuring spaces, analyzing interior building materials for budgetary reasons, and gain a greater understanding of the relationship between interior design and context. The participants' reflective writings further indicated that because the projects focused on a real world problem, students psychologically enjoyed creating residential design solutions that would benefit the client and the families that would move into the homes.

The quantitative findings indicate that at the start of the project students perceived the service component favorably as a means by which students could better comprehend course material. Yet, once the project was completed, the quantitative findings indicated that both sets of students had gained the perception that service work makes no significant difference in enhancing student learning. However, when we look at student groups by academic level, group B students consistently maintain a more favorable perception of design projects that service their community. Even though the quantitative and qualitative findings differ in this case, they both indicate that student learning outside of the classroom in the surrounding community, whether service-based or not, is important and necessary. The findings at the completion of both student projects suggest that interior design students not only gained practical experience in applying classroom knowledge to a real world problem, they also gained a more favorable view of their discipline by being able to experience firsthand how interior design can improve the lives of others in the community.

In terms of whether the service component of the design project encourages students to put forth more of a work effort on the project or improve comprehension of course material, both quantitative and qualitative findings suggest that is not the case. The findings showed evidence that motivation comes from the student's own work ethics and the student's ability to work with a real client that has a building that needs redesigning.

In conclusion, according to Brescia et al. (2009) Gallini and Moely (2003) and Astin et al (2000), the added authenticity of a service component to project-based learning provides opportunities for students to use their technical, critical thinking, and interpersonal skills to gain an understanding of the problems they must solve in their projects. Through this process, students are able to firsthand interweave the application of classroom concepts with real-world situations. This study's has provided evidence that by linking theory, practice and community engagement in design projects, such as those in this study, encourages active student learning and deeper thinking about the field of study. This aforementioned link is important for students in any discipline, but it is particularly important for interior design students because as future professionals they will engage with clients that have unique design requirements and socio-economic backgrounds. These design service projects are relevant and adaptable to any undergraduate or graduate interior design course where design plays a large role.

This study in addition has provided insight into the perceptions of undergraduate sophomore and junior level interior design students toward design service projects. Reflection journals are a factor that considerably contributed to the research study's findings by showing the positive student outcomes achieved through project based service learning. Because the educational and research value of reflection journals is clear, this instructor intends to continue requiring them for design projects. This instructor will further begin to introduce reflection in undergraduate design courses as open class discussion sessions for students to share their experiences throughout the development of design solutions. This new instructional strategy will not only encourage students to reflect upon their own experiences and perceptions of a design issue, but also those of their fellow classmates. As an added benefit, student will practice communication and interpersonal skills while cultivating a classroom community environment that supports the integration of theory with real world challenges.

The research study focus on project-based service from the

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perspective of undergraduate interior design students has provided evidence that community engagement influences the overall student learning experience. However, faculty and community organizations also play key roles on these student projects. Future research should explore how faculty and community organizations' perceptions of project based service projects influence student learning outcomes and how best to facilitate future design service projects. Involvement in socially responsible projects and community building, such as those in this study, also helps to position the university as a community builder that supports student, university and community engagement.

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TABLE 1. Group Mean Responses to Survey Questions

Survey Question	Pre-design project	Pre-design project	Post-design project	Post-design project
	Mean	SD	Mean	SD
1. Written research assignments help me to comprehend class lectures.	2.7143	.99449	2.8571	.66299
2. Hands-on drawing assignments help me to comprehend class lectures.	1.9286	.47463	2.0714	.61573
3. Model-making assignments help me to comprehend class lectures.	2.2857	.61125	2.5000	.75955
4. Experiential projects that combine written research, drawing, and model making help me the most to comprehend the design process.	2.1429	.77033	2.3571	.84190
5. Experiential projects that solely require written research, drawing, or model making helps me the most to comprehend the design process.	3.2857	.82542	2.9286	.91687
6. I prefer experiential projects that have me working by myself.	2.7143	.72627	2.6429	1.08182
7. I prefer experiential projects that require student teams.	2.8571	.66299	2.7143	.72627
8. Experiential student teams make processing course material easier because each member experiences class material in smaller pieces.	2.4286	.85163	2.4286	.85163
9. Student teams make comprehending course material difficult because of members' different interpretations of course material.	2.9286	1.14114	2.3571	.63332
10. Student teams make comprehending course material easier because I am able to vocalize my interpretations with others.	2.1429	.86444	3.4286	.75593
11. Experiential projects help me visualize class lectures.	1.8571	.66299	1.9286	.47463
12. Experiential projects with real-world issues help me to relate class lectures to life.	1.7857	.57893	1.9286	.61573
13. Experiential projects improve my critical thinking skills because I am able to apply my knowledge to a real-world problem.	1.8571	.66299	2.0714	.73005
14. I prefer experiential projects to be conducted outside of the classroom.	2.5714	.51355	2.6429	.74495
15. I prefer experiential projects to be conducted inside of the classroom.	3.1429	.66299	3.0000	.67937
16. Experiential projects outside of the classroom are better because they appear to be more real world.	2.1429	.77033	2.2857	.61125
17. Experiential projects outside of the classroom are better because they occur in real buildings.	2.7143	.72627	2.2143	.57893
18. Experiential projects outside of the classroom are better because I am able to experience the spatial qualities and visualize how to solve the design issues.	2.6429	.63332	2.3571	.63332

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Table 2. Pre-Service Project Descriptive Statistics per Academic Levels and Mann-Whitney U Test

Survey Question	Academic Year	N	Mean	Std. Deviation	Std. Error Mean	Mann-Whitney U Value	Asymp. Sig (2-tailed)
1. Written research assignments help me to comprehend class lecturers	sophomore junior	7 7	3.0000 2.4286	.81650 1.13389	.30861 .42857	16.000	.250
2. Hands on drawing assignments help me to comprehend class lectures	sophomore junior	7 7	2.1429 1.7143	.37796 .48795	.14286 .18443	15.000	.091
3. Model making assignments help me to comprehend to comprehend class lectures	sophomore junior	7 7	2.4286 2.1429	.78680 .37796	.29738 .14286	20.500	.476
4. Experiential projects that combine written research, drawing and model making helps me the most to comprehend the design process	sophomore junior	7 7	2.5714 1.7143	.78680 .48795	.29738 .18443	10.000	.030 *
5. Experiential projects that solely require written research, drawing or model making helps me the most to comprehend the design process	sophomore junior	7 7	3.2857 3.2857	.75593 .95119	.28571 .35952	23.000	.836
6. I prefer experiential projects that have me working by myself	sophomore junior	7 7	2.8571 2.5714	.69007 .78680	.26082 .29738	18.500	.404
7. I prefer experiential projects that require student teams	sophomore junior	7 7	3.0000 2.7143	.57735 .75593	.21822 .28571	18.500	.389
8. Student teams make processing course material easier because each member experiences class material in smaller pieces	sophomore junior	7 7	2.4286 2.4286	.53452 1.13389	.20203 .42857	23.000	.836
9. Student teams make comprehending course material difficult because of members' different interpretation of course material	sophomore junior	7 7	3.2857 2.5714	.95119 1.27242	.35952 .48093	16.000	.253
10. Student teams make comprehending course material easier because I am able to vocalize my interpretations with others	sophomore junior	7 7	2.1429 2.1429	.69007 1.06904	.26082 .40406	23.000	.836
11. Experiential projects help me visualize class lectures	sophomore junior	7 7	2.1429 1.5714	.37796 .78680	.14286 .29738	12.500	.085
12. Experiential projects real world issues help me to relate class lectures to life	sophomore junior	7 7	2.1429 1.4286	.37796 .53452	.14286 .20203	9.000	.019 *
13. Experiential projects improve my critical thinking skills because I am able to apply my knowledge to a real world problem	sophomore junior	7 7	2.2857 1.4286	.48795 .53452	.18443 .20203	7.500	.015 *
14. I prefer experiential projects to be conducted outside of the classroom	sophomore junior	7 7	2.5714 2.5714	.53452 .53452	.20203 .20203	24.500	1.000
15. I prefer experiential projects to be conducted inside of the classroom	sophomore junior	7 7	3.2857 3.0000	.48795 .81650	.18443 .30861	19.500	.473
16. Experiential projects outside of the classroom are better because they appear to be more real world	sophomore junior	7 7	2.8571 2.4286	.37796 .78680	.14286 .29738	15.500	.179
17. Experiential projects outside of the classroom are better because they occur in real buildings	sophomore junior	7 7	2.4286 1.8571	.78680 .69007	.29738 .26082	15.000	.155
18. Experiential projects outside of the classrooms are better because I am able to experience the spatial qualities and visualize how to solve the design	sophomore junior	7 7	3.0000 2.4286	.57735 .78680	.21822 .29738	17.000	.227

* indicates a Mann-Whitney p-value less than 0.05

Table 3. Post-Service Project Descriptive Statistics per Academic Level and Mann-Whitney U Test

Survey Question	Academic Year	N	Mean	Std. Deviation	Std. Error Mean	Mann-Whitney U Value	Asymp. Sig (2-tailed)
1. Written research assignments help me to comprehend class lecturers	sophomore junior	7 7	3.2857 2.4286	.48795 .53452	.18443 .20203	7.500	.015*
2. Hands on drawing assignments help me to comprehend class lectures	sophomore junior	7 7	2.2857 1.8571	.75593 .37796	.28571 .14286	18.000	.173
3. Model making assignments help me to comprehend to comprehend class lectures	sophomore junior	7 7	2.2857 2.7143	.75593 .75593	.28571 .28571	15.500	.177
4. Experiential projects that combine written research, drawing and model making helps me the most to comprehend the design process	sophomore junior	7 7	2.8571 1.8571	.69007 .69007	.26082 .26082	8.000	.024 *
5. Experiential projects that solely require written research, drawing or model making helps me the most to comprehend the design process	sophomore junior	7 7	3.1429 2.7143	.89974 .95119	.34007 .35952	18.500	.417
6. I prefer experiential projects that have me working by myself	sophomore junior	7 7	3.1429 2.1429	.69007 1.21499	.26082 .45922	12.500	.107
7. I prefer experiential projects that require student teams	sophomore junior	7 7	2.7143 2.7143	.75593 .75593	.28571 .28571	24.500	1.000
8. Student teams make processing course material easier because each member experiences class material in smaller pieces	sophomore junior	7 7	2.4286 2.4286	.78680 .97590	.29738 .36886	23.500	.872
9. Student teams make comprehending course material difficult because of members' different interpretation of course material	sophomore junior	7 7	3.7143 3.1429	.48795 .89974	.18443 .34007	15.500	.196
10. Student teams make comprehending course material easier because I am able to vocalize my interpretations with others	sophomore junior	7 7	2.4286 2.2857	.78680 .48795	.29738 .18443	24.000	.943
11. Experiential projects help me visualize class lectures	sophomore junior	7 7	2.0000 1.8571	.57735 .37796	.21822 .14286	21.500	.593
12. Experiential projects real world issues help me to relate class lectures to life	sophomore junior	7 7	2.0000 1.8571	.57735 .69007	.21822 .26082	21.500	.653
13. Experiential projects improve my critical thinking skills because I am able to apply my knowledge to a real world problem	sophomore junior	7 7	2.4286 1.7143	.78680 .48795	.29738 .18443	12.500	.054
14. I prefer experiential projects to be conducted outside of the classroom	sophomore junior	7 7	2.7143 2.5714	.75593 .78680	.28571 .29738	21.500	.674
15. I prefer experiential projects to be conducted inside of the classroom	sophomore junior	7 7	3.0000 3.0000	.57735 .81650	.21822 .30861	24.500	1.000
16. Experiential projects outside of the classroom are better because they appear to be more real world	sophomore junior	7 7	2.5714 1.8571	.53452 .37796	.20203 .14286	21.500	.653
17. Experiential projects outside of the classroom are better because they occur in real buildings	sophomore junior	7 7	2.5714 2.0000	.53452 .57735	.20203 .21822	12.500	.081
18. Experiential projects outside of the classrooms are better because I am able to experience the spatial qualities and visualize how to solve the design	sophomore junior	7 7	2.5714 2.1429	.53452 .69007	.20203 .26082	16.000	.225

* indicates a Mann-Whitney p-value less than 0.05

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Table 4. Group Mean Responses to Survey Questions

Survey Question	Pre-design project	Pre-design project	Post-design project	Post-design project
	Mean	SD	Mean	SD
19. Working on an experiential project that services my local community encourages me to engage more in comprehending the course material.	2.2143	.69929	2.3571	.74495
20. Working on an experiential project that services my local community makes me explore a greater number of design solutions.	2.2857	.72627	2.7143	.72627
21. Working on an experiential project that services my local community makes me work harder to do my best design work.	2.4286	.85163	2.6429	.74495
22. I prefer working on an experiential project that services my local community because I can experience firsthand how my design will affect occupants.	2.1429	.86444	2.2143	.80178
23. I prefer working on an experiential project that services my local community because I am helping my local community.	2.5000	.75955	2.0714	.73005
24. I prefer working on an experiential project that services my local community because it makes solving the problem correctly and creatively more important.	2.3571	.84190	2.6429	.74495
25. I prefer experiential projects that are service-based rather than just solely experiential learning projects.	2.6429	.84190	2.7143	.72627
26. I prefer working on an experiential project that services my local community with a student team rather than by myself.	2.3571	.84190	2.5714	1.01635
27. I prefer working on an experiential project that services my local community by myself rather than with a student team.	3.2143	.80178	3.1429	.94926

Table 5. Pre-Service Project Means per Academic Levels and Mann-Whitney U Test

Survey Question	Academic Year	N	Mean	Std. Deviation	Std. Error Mean	Mann-Whitney U Test Values	Asymp. Sig. (2-tailed)
19. Working on an experiential project that services my local community encourages me to engage more in comprehending the course material.	sophomore junior	7 7	2.5714 1.8571	.78680 .37796	.29738 .14286	12.000	.045*
20. Working on an experiential project that services my local community makes me explore a greater number of design solutions.	sophomore junior	7 7	2.4286 2.1429	.78680 .69007	.29738 .26082	21.000	.600
21. Working on an experiential project that services my local community makes me work harder to do my best design work.	sophomore junior	7 7	2.4286 2.4286	1.13389 .53452	.42857 .20203	22.000	.722
22. I prefer working on an experiential project that services my local community because I can experience firsthand how my design will affect occupants.	sophomore junior	7 7	2.7143 1.5714	.75593 .53452	.28571 .20203	6.000	.011*
23. I prefer working on an experiential project that services my local community because I am helping my local community.	sophomore junior	7 7	2.8571 2.1429	.69007 .69007	.26082 .26082	12.000	.083
24. I prefer working on an experiential project that services my local community because it makes solving the problem correctly and creatively more important.	sophomore junior	7 7	2.7143 2.0000	.75593 .81650	.28571 .30861	13.500	.133
25. I prefer experiential projects that are service-based rather than just solely experiential learning.	sophomore junior	7 7	3.0000 2.2857	.57735 .95119	.21822 .35952	14.500	.135
26. I prefer working on an experiential project that services my local community with a student team rather than by myself.	sophomore junior	7 7	2.5714 2.1429	.78680 .89974	.29738 .34007	19.000	.453
27. I prefer working on an experiential project that services my local community by myself rather than with a student team.	sophomore junior	7 7	3.0000 3.4286	.57735 .97590	.21822 .36886	18.000	.354

* indicates a Mann-Whitney p-value less than 0.05

Table 6. Post-Service Project Means per Academic Levels and Mann-Whitney U Test

Survey Question	Academic Year	N	Mean	Std. Deviation	Std. Error Mean	Mann-Whitney U Test Values	Asymp. Sig. (2-tailed)
19. Working on an experiential project that services my local community encourages me to engage more in comprehending the course material.	sophomore junior	7 7	2.7143 2.0000	.75593 .57735	.28571 .21822	12.000	.073
20. Working on an experiential project that services my local community makes me explore a greater number of design solutions.	sophomore junior	7 7	2.8571 2.5714	.69007 .78680	.26082 .29738	18.500	.404
21. Working on an experiential project that services my local community makes me work harder to do my best design work.	sophomore junior	7 7	2.7143 2.5714	.75593 .78680	.28571 .29738	21.500	.674
22. I prefer working on an experiential project that services my local community because I can experience firsthand how my design will affect occupants.	sophomore junior	7 7	2.5714 1.8571	.78680 .69007	.29738 .26082	13.000	.101
23. I prefer working on an experiential project that services my local community because I am helping my local community.	sophomore junior	7 7	2.4286 1.7143	.78680 .48795	.29738 .18443	12.500	.054
24. I prefer working on an experiential project that services my local community because it makes solving the problem correctly and creatively more important.	sophomore junior	7 7	3.0000 2.2857	.57735 .75593	.21822 .28571	12.000	.073
25. I prefer experiential projects that are service-based rather than just solely experiential learning.	sophomore junior	7 7	2.8571 2.5714	.89974 .53452	.34007 .20203	20.500	.578
26. I prefer working on an experiential project that services my local community with a student team rather than by myself.	sophomore junior	7 7	2.7143 2.4286	.75593 1.27242	.28571 .48093	20.500	.595
27. I prefer working on an experiential project that services my local community by myself rather than with a student team.	sophomore junior	7 7	3.1429 3.1429	.69007 1.21499	.26082 .45922	23.500	.894

* indicates a Mann-Whitney p-value less than 0.05